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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/538,505	06/09/2005	Keiichi Murakami	2005-0872A	7088
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary**Application No.**

10/538,505

Applicant(s)

MURAKAMI, KEIICHI

Examiner

THIEM PHAN

Art Unit

3729

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 June 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SF/ICE)
- Paper No(s)/Mail Date 6/16/08
- 4) ☐ Interview Summary (PTO-413)
- Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

1. The amendment filed on 6/16/08 has been fully considered and made of record.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-4, 7, 8 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yasue et al (US 6,010,768) in view of Applicant's Admitted Prior Art, hereinafter AAPA.

Regarding claims 1 and 7, Yasue et al teach a method of producing multilayer printed circuit board which includes forming a thermosetting resin layer (Fig. 3C, 14) so as to fill spaces between circuit patterns (Fig. 3C, 5 & 5') formed on a surface of the printed wiring board (Fig. 3C, 1), heating and curing the resin layer (Col. 23, lines 52 & 53), and then polishing the cured resin layer covering the circuit patterns, thereby exposing the circuit patterns (Col. 24, lines 1-4), wherein the step of heating and curing the resin layer comprises:

- heating the resin layer in the pressed state to a curing temperature at which the resin layer is cured to a high harness (Col. 23, lines 56-60);
- cooling the resin layer once cured for buff polishing (Col. 23, lines 61-64).

AAPA teaches a method of manufacturing multilayer printed wiring board, which teaches the pressing of the non-cured resin sheet by a plate or the like in a reduced pressure atmosphere

(Specification, page 2, section 0005) against the circuit board, in order to remove the air bubbles in the resin before the processing of the resin by pressing and heating and cooling of the resin.

It would be obvious to one of ordinary skill in the art at the time the invention was made to modify the method of Yasue et al by applying the resin sheet pressing at reduced pressure atmosphere of the non-cured resin in a reduced pressure chamber, as taught by AAPA, in order to remove the air bubbles in the resin before the heating and curing then pressure release by letting in outside air and finally the cooling of the resin layer before the polishing process.

Regarding claim 2, AAPA teaches that the applied pressure is increased in predetermined steps (Specification, page 2, section 0005) in order to press or flatten the resin layer with a plate or the like.

Regarding claims 3 and 4, 8, 10, Yasue et al in view of AAPA teach a method of producing multilayer printed circuit board including the pressing of resin layer (AAPA, page 2, section 0005) and the resin particles of size about $1/10^{\text{th}}$ of the circuit patterns thickness (Yasue et al; col. 23, lines 42-45), which reads on applicant's claimed invention; except for pressing the resin layer with a metallic foil having a roughened surface facing said resin layer.

At the time the invention was made, it would have been an obvious matter of design choice to a person of ordinary skill in the art to have a metallic foil with a roughened surface pressing against said resin layer because applicant has not disclose that having a metallic foil with a roughened surface pressing against said resin layer provides an advantage, is used for a particular purpose, or solves a stated problem. One of ordinary skill in the art, furthermore, would have expected applicant's invention to perform equally well with a pressing against the resin layer because it forces the resin layer to fill spaces between circuit patterns (AAPA, page 2,

section 5; Yasue et al, fig. 3C, 5) as well.

Therefore, it would have been an obvious matter of design choice to modify Yasue et al in view of AAPA to obtain the invention as specified in Claim 3.

4. Claims 5, 6, 9 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yasue et al in view of AAPA and further view of Fukutomi et al (US 6,268,648).

Regarding claims 5, 6, 9 and 11, Yasue et al in view of AAPA teach a method of producing multilayer printed circuit board including the copper circuit patterns (AAPA, page 1, section 0002) and the pressing against the resin layer (AAPA, page 2, section 0005), which reads on applicant's claimed invention; except for having a pressing metallic foil formed of different metal than the copper circuit patterns.

Fukutomi et al teach a method of manufacturing a semiconductor chip package substrate, using a nickel metallic layer (Fig. 7, 11), which is used to press and bury the copper wiring (Fig. 7, 12) against and into the prepreg (Fig. 7, 14) in order to form a barrier layer (Abstract) to a carrier layer (Fig. 7, 10).

It would be obvious to one of ordinary skill in the art at the time the invention was made to modify the method of Yasue et al in view of AAPA by applying the nickel metallic layer different from the copper circuit, as taught by Fukutomi et al, in order to form a barrier layer to a carrier layer.

Response to Arguments

5. Applicants' arguments filed on 6/18/08 have been fully considered but they are not

persuasive for the following reasons:

Applicants' assertions that the prior art does not teach the limitation of introducing air into the reduced pressure environment while maintaining the pressed state and the curing temperature (Remarks, page 10) are traversed because Yasue et al teach the pressing and the heating of the resin to a cured hardness while AAPA teaches the pressing of the non-cured resin in a reduced pressure atmosphere to remove air bubbles from the resin, therefore it would be obvious to one of ordinary skill in the art to combine the two teachings by applying the non-cured resin pressing under reduced pressure atmosphere, as taught by AAPA, to remove all the air bubbles then to further heat and pressure to cure the resin to high hardness, after the resin is fully cured to high hardness, it would be obvious to bring the pressure atmosphere back to normal by letting air into the chamber environment of the previously reduced pressure atmosphere as the resin is already hardened and to slowly decrease the physical pressure and heating of the hardened resin in order to avoid any cracking due to abrupt changing in temperature and finally to let the resin cooled down for further sanding and polishing.

Therefore, the limitation of introducing air into the reduced pressure environment while maintaining the pressed state and the curing temperature is obvious as the resin is already hardened by curing and the slow physical pressure release and cooling is to avoid cracking the resin.

Furthermore, this obviousness is cited in view of the recent Supreme Court's decision in the *KSR* case, 72 FR 57526. In the guidelines seven possible rationales are laid out for an obviousness rejection: "(A) Combining prior art elements according to known methods to yield predictable results; (B) Simple substitution of one known element for another to obtain

predictable results; (C) Use of known technique to improve similar devices (methods, or products) in the same way; (D) Applying a known technique to a known device (method, or product) ready for improvement to yield predictable results; (E) 'Obvious to try'--choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success; (F) Known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces if the variations would have been predictable to one of ordinary skill in the art; (G) The TSM test where some teaching, suggestion, or motivation in the prior art that would have led one of ordinary skill to modify the prior art reference or to combine prior art reference teachings to arrive at the claimed invention." *Id.* at 57529. The claims' rejection under 103(a) is applied with respect to the above notation, especially with the last rationale.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicants' disclosure.

Applicants' amendment necessitated the new ground of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicants are reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tim Phan whose telephone number is 571-272-4568. The examiner can normally be reached on M & Tu, 6AM - 2PM, and W & Th, 9AM – 5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Peter Vo can be reached on 571-272-4690. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Phan Thiem/
Examiner, Art Unit 3729

September 17, 2008